Space Weather Forecast

Issued on Tuesday, 07 March 2023 at 00:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate class flares (R1-R2/Minor-Moderate radio blackouts) likely. Chance of G1/Minor Storm intervals especially between 07 and 08 Mar.
Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours, with four Moderate-class flares, the strongest of these from a complex region close to the northwest limb. There are eleven sunspots on the disc, with the largest and most magnetically complex region located in the northeast quadrant. A region in the southwest appears to be developing but is still relatively simple magnetically. The remaining regions are relatively simple and inactive.

No Earth directed CMEs were observed in available imagery. A CME observed leaving the southwest limb early on 6 Mar, has now been analysed with model results showing a clear miss.

Solar Wind / Geomagnetic Activity: The solar wind speeds at Earth have been influenced by a fast solar wind, with elevated to strong speeds, but with a slow overall decrease since around 06/0900UTC. Total magnetic field strength was weak, with the important north-south component also varying weakly. Geomagnetic activity was Quiet to Active (Kp 2 to 4).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be mainly Low to Moderate, due to the presence of a number of significant sunspot regions across the disc. There is a risk of Strong activity due to the complexity of two regions, one on the northwest limb and one in the northeast quadrant.

Solar Wind / Geomagnetic Activity: No significant Earth-directed CMEs feature in the current forecast, with only a glancing blow possible on 07 or 08 Mar. A current fast solar wind is expected to wane through 07 Mar, with a further high speed stream possibly connecting on 08 Mar. Geomagnetic activity is expected to be mainly Quiet to Unsettled, with a risk of Active to G1/Minor storm intervals due mainly to any possible CME glance. There is also a risk of G1/Minor Storm intervals on 08 Mar due to a further fast solar wind connection.

Energetic Particles / Solar Radiation: Solar radiation levels are most likely to stay at background, but with a slight chance of reaching the S1/Minor Storm threshold or greater should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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